

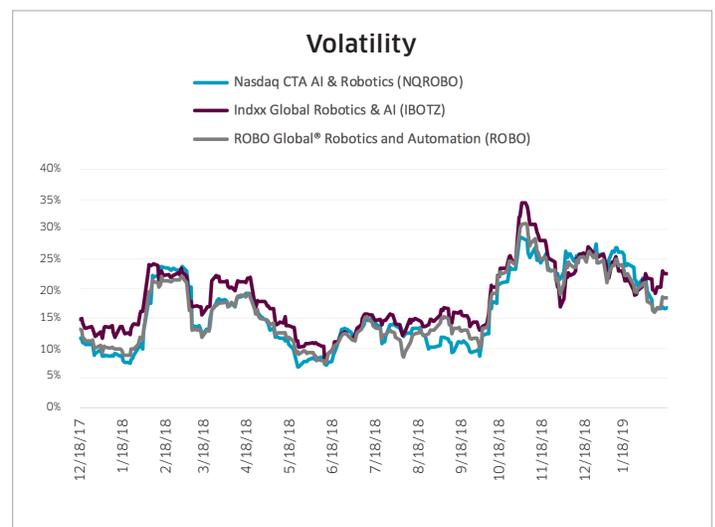
# Artificial Intelligence and Robotics Indexes

## Nasdaq Rising to the Top of the Pack

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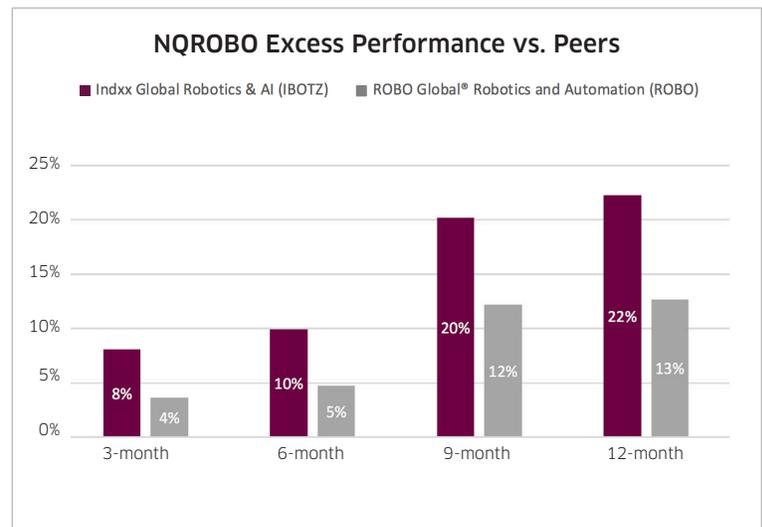
### What's driving the superior performance of NQROBO?

The Nasdaq CTA Artificial Intelligence and Robotics Index (NQROBO) outperformed the Global Robotics & Artificial Intelligence Thematic Index (IBOTZ) and the ROBO Global Robotics and Automation Index (NQROBO: 5.04% vs. IBOTZ: -16.25% and ROBO: -7.00%) while the volatility has remained close.



Source: Nasdaq, Bloomberg. Note: Data from 12/18/2017 to 2/15/2019.

Since launch, the Nasdaq CTA AI & Robotics Index ("the Index") has consistently outperformed its peers in the space. On a 6-month rolling basis, the Index shows superior returns through the entire period - illustrated in the first chart below - where it outperformed IBOTZ by 12% and ROBO by 7%, on average. The second chart shows the excess performance of NQROBO compared to its peers on a 3-, 6-, 9- and 12-month basis. The Index clearly remains the top performer in every period studied, showing an excess return of 22% compared to IBOTZ and 13% compared to ROBO on a one year basis as of February 15, 2019, and consistently outperformed during the shorter periods shown below.



All three indexes were designed to provide global exposure to the Artificial Intelligence and Robotics space. Despite the similar thematic coverage, each of the indexes offers a different perspective. Out of the 149 unique holdings across the indexes, only 16 are common in all three. It is critical for investors who want to gain access to the AI and Robotics space to have a deep understanding of the differences in these indexes and what’s driving the divergence in performance.

The important difference about NQROBO when compared to the other two indexes is that its tiered methodology is designed to track the three levels of the AI and Robotics industry involvement by classifying companies in the space into one of three categories: enabler, engager and enhancer.

- **Enablers** are companies that develop the building block components for robotics or artificial intelligence, such as advanced machinery, autonomous systems/self-driving vehicles, semiconductors, databases used for machine learning.
- **Engagers** are companies that design, create, integrate, or deliver robotics and/or artificial intelligence in the form of products, software, or systems.
- **Enhancers** are companies that provide their own value-added services within the Artificial Intelligence and Robotics ecosystem, but which are not core to their product or service offering.

Each of the three classifications has its own tiered weighting that is updated at each rebalance: enablers are 25%, engagers are 60% and enhancers are 15% (for more information on the index methodology, click [here](https://indexes.nasdaqomx.com/docs/methodology_NQROBO.pdf)<sup>1</sup>). While IBOTZ and ROBO include companies that either serve as building blocks (enablers) or are directly involved in creating products or services (engagers), these indexes generally overlook companies that leverage artificial intelligence and robotics to make these products or services more valuable (enhancers). By company count, 53% of “engager” and 81% of “enhancer” companies in NQROBO are unique to the Index and do not appear in IBOTZ or ROBO. It’s important to note the very strong performance of these missing names from the competing indexes. The companies only in NQROBO that are engagers show a weighted performance of 6.0% since they were added to the Index, while enhancers dropped -1.0% (mainly driven by companies that were added during the September 2018 market peak) and enablers slid 0.8% (still a far cry from the negative returns experienced by the competing indexes on aggregate since 12/18/2017). In addition, it’s worth pointing out the weighted performance by each category (enablers and enhancers were slightly negative at -2.7 and -0.3%, respectively, and engagers were positive at 9.3%). See below for this information and other statistics further breaking out the Index by enablers, engagers and enhancers.

<sup>1</sup> [https://indexes.nasdaqomx.com/docs/methodology\\_NQROBO.pdf](https://indexes.nasdaqomx.com/docs/methodology_NQROBO.pdf)

	<b>ENABLER</b>	<b>ENGAGER</b>	<b>ENHANCER</b>
Example Companies	Nvidia, Intuitive Surgical	Illumina, Dassault Systems	Tesla, Amazon
Weight in the Index	24.3%	60.9%	14.8%
Total Count	30	30	32
No. Companies only in NQROBO	7	16	26
% Companies only in NQROBO	23.3%	53.3%	81.3%
<b>Weighted Performance*</b>	<b>-2.7%</b>	<b>9.3%</b>	<b>-0.3%</b>
<b>Weighted Performance of Unique</b>	<b>-0.8%</b>	<b>6.0%</b>	<b>-1.0%</b>

Source: Nasdaq, FactSet. Note: Data as of 2/15/2019.

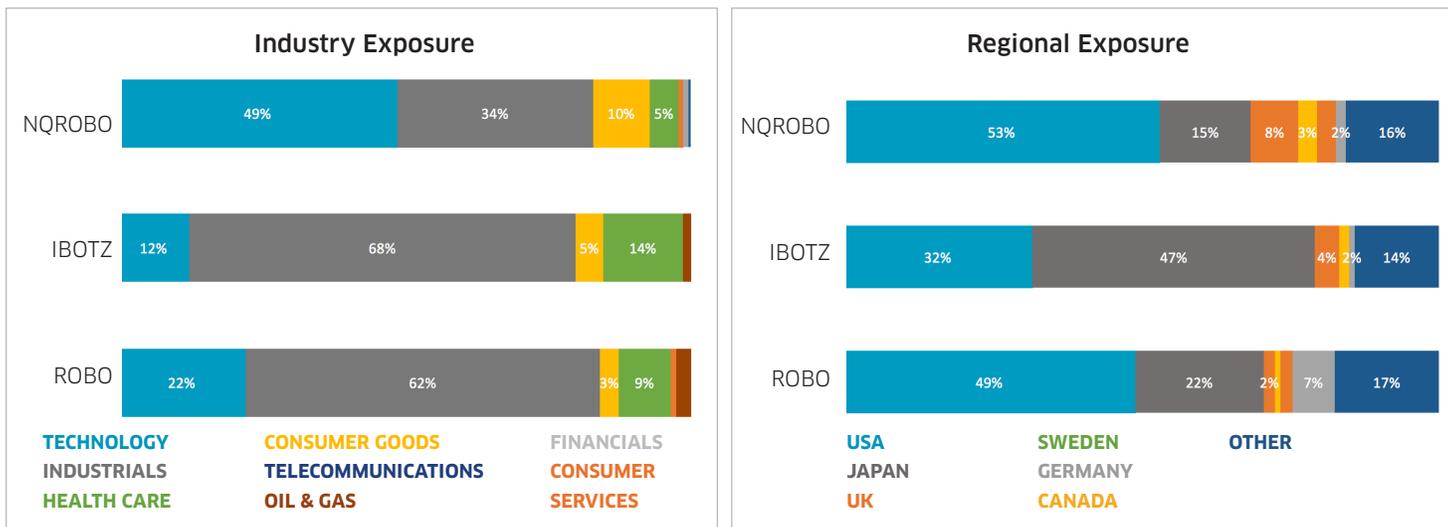
\* Performance figures calculated since companies were added to the Index. Most companies have been in the Index since launch on 12/18/2017, while others were added in March or September 2018.

Examples of these “engager” and “enhancer” companies in NQROBO that do not appear in IBOTZ or ROBO and have driven the strong performance of the Index are shown below.

<b>IN INDEX SINCE</b>	<b>SYMBOL</b>	<b>COMPANY NAME</b>	<b>COUNTRY DOMICILE</b>	<b>INDUSTRY</b>	<b>CTA CATEGORY</b>	<b>PERFORMANCE SINCE ADDED TO INDEX</b>	<b>INDEX WEIGHT</b>
12/18/2017	NOW	Servicenow	US	Technology	Engager	80%	2.39%
12/18/2017	AVV	Aveva	GB	Technology	Engager	64%	2.23%
12/18/2017	QQ	Qinetiq	GB	Industrials	Engager	31%	1.98%
12/18/2017	4684	Obic	JP	Technology	Engager	29%	2.05%
9/24/2018	CIEN	Ciena	US	Technology	Engager	28%	2.32%
12/18/2017	GRMN	Garmin	CH	Consumer Goods	Engager	22%	2.02%
12/18/2017	ANSS	Ansys	US	Technology	Engager	18%	2.03%
9/24/2018	AVLR	Avalara	US	Technology	Enhancer	22%	0.69%
9/24/2018	OMCL	Omicell	US	Health Care	Enhancer	18%	0.47%
12/18/2017	9984	Softbank	JP	Telecommunications	Enhancer	16%	0.49%

Source: Nasdaq, FactSet. Note: Data as of 2/15/2019.

In addition, the three indexes in the space provide quite distinct country and industry exposures despite the fact that, in theory, these all provide global exposure to the AI and Robotics space.



Source: Nasdaq, Indxx, ROBO Global, Bloomberg. Note: Data as of 2/15/2019

NQROBO assigns the highest weight to companies domiciled in the USA (53%) followed by ROBO (49%), while IBOTZ tilts more heavily towards Japan (47%).

When comparing the industry breakdown of the three indexes in question, NQROBO provides the highest exposure to the Technology sector (49%) when compared to IBOTZ (12%) and ROBO (22%). The other key difference is that ROBO and IBOTZ both assign the highest weight to Industrials (68% and 62%, respectively), while NQROBO allocates a lower weight (34%) to this sector.

This analysis shows that while NQROBO, IBOTZ and ROBO share the common theme of global AI, Robotics and Automation, their underlying components vary greatly from one index to another and hence, drive a divergence in performance.

## Conclusion

The Nasdaq CTA Artificial Intelligence & Robotics Index (NQROBO) offers investors a robust exposure to the global AI and Robotics market while ensuring investability, sufficient liquidity and size. Though there are other indexes which provide exposure to the global AI, Robotics and Automation fields, there is a distinct disparity in the underlying basket of stocks. NQROBO’s methodology, which includes enablers, engagers and enhancers, captures companies in all three stages of the AI and Robotics space.

Investors looking to get exposure to the artificial intelligence and robotics industries can invest in the product tied to NQROBO, the First Trust Nasdaq Artificial Intelligence and Robotics ETF in the U.S. (XNAS: ROBT), the Cathay Nasdaq AI & Robotics ETF in Taiwan (TWSE: 00737) and the Ping An Nasdaq AI & Robotics ETF in Hong Kong (HKEX: 3023).

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